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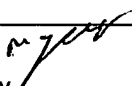
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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/697,001 | 10/31/2003 | Kyoko Matsuda | 0033-0907P | 8244 |
| 2292 | 7590 | 04/28/2006 | EXAMINER | |
| BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747 | | | VAN ROY, TOD THOMAS | |
| | | | ART UNIT | PAPER NUMBER |

2828

DATE MAILED: 04/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|---|--------------------------------|--|
| Office Action Summary | Application No. 10/697,001 | Applicant(s) MATSUDA ET AL. | |
| | Examiner Tod T. Van Roy  | Art Unit 2828 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 8-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

The examiner acknowledges the amending of claim 1.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 2 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 2 states a limitation, the active layer having two light amplifying regions formed on lateral sides of the saturable absorber region, which is not supported by the *elected Species which relates to figures 1-6*. This limitation is more properly referred to **fig.9**, which was not part of the chosen Species.

Response to Arguments

With respect to the 35 U.S.C 112 rejection of claim 2, the examiner did in fact point out the limitation of claim 2 is present in the drawings as stated by the applicant (Remarks, pg.10), however, it was clearly stated that the drawing containing the limitation was not part of the Species elected for examination. As the limitation is not

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taught by the elected species, the examiner feels that the rejection of the claim is proper and will remain as rejected.

Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

In response to applicant's arguments, the recitation "...an optical output modulated to arise stochastic resonance..." has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hiraio*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Please see below for an updated rejection to claim 1.

Applicant's arguments filed 03/08/2006 have been fully considered but they are not persuasive.

With respect to claims 3, and 5-7, the applicant has stated the combination of Jacquet and Kappeler is not obvious due to the fact that Kappeler does not make use of a bistable state in his system, or that the optical output is large.

The examiner agrees with the applicant that Kappeler does not make mention of the use of the driving scheme with a bistable device, however it is believed that the

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benefits of the biasing are applicable to both bistable and non-bistable devices.

Kappeler teaches the purpose of the driving system is for the reduction of mode hopping in laser diodes (col.1 lines 20-27). This phenomenon is believed to be present in bistable devices, such as that of Jacquet, particularly when the diode has not employed means of preventing mode hopping or limiting the likelihood of additional modes being present by use of a grating or otherwise. For this reason it is believed that the combination of Jacquet and Kappeler would be obvious to one of ordinary skill in the art.

In addition, the condition that the optical output be large is not necessarily limiting as written, since an output could very well be considered large if compared with a device that has no output whatsoever.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 1 is rejected under 35 U.S.C. 103(a) as being anticipated by Jacquet et al. (US 5283799) in view of Ishikawa (JP 02-137383, applicant submitted prior art).

With respect to claim 1, Jacquet teaches a semiconductor laser reducing feedback-induced noise comprising: an active layer having a light amplifying region and a saturable absorber region (col.2 lines 60-66, col.6 lines 10-13) formed to allow said semiconductor laser to be in a bistable state (col.1 lines 16-17), an electrode of a first polarity (fig.1 E1), and an electrode of a second polarity provided in relation to said electrode of the first polarity (fig.1 #2), at least one of said electrode of the first polarity and said electrode of the second polarity is divided to allow a current to be injected independently into said light amplifying region and said saturable absorber region (col.3 lines 4-10, 20-25). Jacquet does not teach controlling the hysteresis to adjust the lasing threshold of the laser. Ishikawa teaches a bistable device wherein the hysteresis is controlled to adjust the lasing threshold (abs.). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the bistable device of Jacquet with the bistable threshold controlled device of Ishikawa in order to obtain a large modulation optical output without a driver circuit (Ishikawa, abs.) and exert a higher degree of control over the device via adjustment of the threshold conditions.

Claims 3, 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacquet and Ishikawa in view of Kappeler (US 6205161).

With respect to claims 3 and 5, Jacquet and Ishikawa teach the bistable device as outlined in the rejection to claim 1, including the DC driving of the device, but do not disclose driving the device using a modulated signal with a superimposed noise current. Kappeler teaches a method for operating a laser diode wherein a modulated current signal superimposed with a noise current (col.8 lines 36-40, col.8-9 lines 66-5) having a random intensity change (col.8 lines 38-39, col.9 lines 60-65) is used to drive the device. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the device of Jacquet and Ishikawa with the driving current of Kappeler in order to suppress the occurrence of mode hopping (col.8 lines 61-65).

With respect to claim 6, Jacquet, Ishikawa and Kappeler teach the bistable device as outlined in the rejection to claim 3, and Jacquet further teaches the ratio of the absorber to be between 50% and 1% of the length of the resonator (fig.1 S2, col.6 lines 25-37)

With respect to claim 7, Jacquet, Ishikawa and Kappeler teach the bistable device as outlined in the rejection to claim 3, but do not teach the difference between the maximum and minimum value of the noise current to be at most an amplitude of the modulation current. It would have been obvious to one of ordinary skill in the art at the time of the invention to sustain the noise current amplitude below that of the modulation current as doing otherwise would, in essence, change the noise current into the modulation current and vice versa (the noise current would then essentially be responsible for driving the device, with a small modulation signal added to it).

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Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacquet, Ishikawa, and Kappeler in view of Suzuki et al. (US 5394260).

With respect to claim 4, Jacquet, Ishikawa and Kappeler teach the bistable device as outlined in the rejection to claim 3, including the use of a modulated driving current, but do not teach the modulated current to have a rectangular wave. Suzuki teaches a semiconductor laser incorporated with an absorber wherein a modulated rectangular wave is used to drive the device (col.8 lines 1-4). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the bistable, modulated device of Jacquet, Ishikawa and Kappeler with the rectangular wave of Suzuki in order to generate a pulse with fast rise and fall times (Suzuki, col.8 lines 5-6) and output pulses from the device which more closely resemble logic ones and zeroes.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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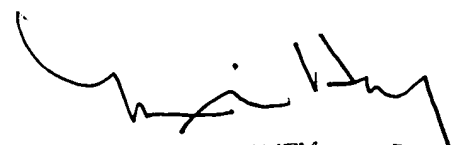
shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tod T. Van Roy whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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MIN SUN HARVEY
PRIMARY EXAMINER